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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/804,857

03/13/2001

Zhao Liu

19282-023

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20028

7590

10/04/2004

LAW OFFICE OF BARRY R LIPSITZ  
755 MAIN STREET  
MONROE, CT 06468

EXAMINER

PHAM, BRENDA H

ART UNIT

PAPER NUMBER

2664

DATE MAILED: 10/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/804,857

**Applicant(s)**

LIU ET AL.

**Examiner**

Brenda Pham

**Art Unit**

2664

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 March 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12-21 is/are allowed.
- 6) ☒ Claim(s) 1,10,11,22 and 23 is/are rejected.
- 7) ☒ Claim(s) 2-9 and 24 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3/13/2001.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

1. Claims 1-24 have been examined.

#### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 10, 11 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by SRIRAM (US 5,463,620).

Claims 1, 10, 11 and 22, SRIRAM discloses a packetized-data processing apparatus comprising (figure 5): a memory **(32, 34, 36, 38, 40, 42, 44 and 46)** configured to store core groups of packetized data;

a channel **(28)** coupled to the memory **(32, 34, 36, 38, 40, 42, 44 and 46)** and having a total bandwidth **(150 Mb/s)** for transferring packets of data from the core groups; and

a scheduler **(48)** operatively coupled to the memory **(32, 34, 36, 38, 40, 42, 44 and 46)** and the channel **(28)** and configured to allocate amounts of the total bandwidth of the channel **(total 150 Mb/s on link 28)** to each of the core groups **(32, 34, 36, 38, 40, 42, 44 and 46)** that is backlogged while limiting the amount of allocated bandwidth and a corresponding transfer rate of packets of data for each core group to a maximum allowable bandwidth for each core group **(a predetermined percentage of bandwidth**

**assigned to queue 32 is 10 Mb/s, 10 Mb/s for queue 34, 20 Mb/s for queue 36, etc.)** to schedule transfer of packetized data of the core groups from the memory to the channel in accordance with the respective amounts of allocated bandwidth for the core groups (column 5, 6, lines 50-67 and 1-20, respectively).

**{A scheduler (server 48) configured to allocate a predetermined percentage of the total bandwidth of the channel to each of the core groups, such as 10 Mb/s for voice, 10Mb/s for low-speed data, and 20Mb/s for video (CBR), etc.,(see figure 5). The total bandwidth of the channel is 150Mb/s. The percentage of bandwidth assigned to each core group is a guaranteed minimum percentage of the total bandwidth available on the output links 28. These assigned percentage of bandwidth are also the maximum allowable bandwidth can be reserved for each core group during a cycle time period  $D_c$ .**

The traffic contained in the queuing circuits in FIG. 5 is guaranteed a minimum percentage of the total bandwidth available on the output link 28. In the example shown in FIG. 5, the server 48 withdraws thirty cells from the voice queue 32 on line 33 and transmits those thirty voice cells onto the output link 28. The bandwidth on line 33 and the bandwidth on link 28 devoted to voice traffic thus is 10 Mb/s. After those voice cells have been transmitted, the server 48 then withdraws thirty cells from the low speed data queue 34 on a line 35. The bandwidth of line 35 and the bandwidth on output link 28 devoted to low speed-data thus is 10 Mb/s. Similarly, during the cycle time period the server 48 withdraws sixty cells from CBR video queue 36 on line 37 and so on. The server

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48 in effect defines a cycle time period  $D_c$  during which it will retrieve cells from all of the queues having cells to send. The server 48 divides the cycle time period into time slices  $T_1, T_2, \dots, T_n$ , assigns a time slice to each of the queues, and permits each queue to empty cells onto the output link 28 during its respective time slice. The server 48 accomplishes this by visiting each queue in sequence, removing a predetermined number of cells from each queue, and then moving on to remove a predetermined number of cells from the next queue in sequence. If any one of the queues contains no cells, then the server completely passes over the empty queue and immediately moves on to the next queue in sequence to remove its allotted number of cells. If any of the queues contains a number of cells the server 48 is scheduled to remove during cycle time period, then the server 48 removes cell from that queue until it is empty and immediately moves on to the next queue.}

#### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over SRIRAM (US 5,463,620).

Claim 23, as explained in the rejection statement of claim 22 (parent claim), SRIRAM discloses all claim limitations recited in claim 22.

Although SRIRAM does not teach wherein the control means controls the amounts of bandwidths for each group by applying a weighted deficit round robin algorithm, the Deficit Round Robin algorithm has been widely used in packet-based traffic scheduling for its fairness and implementation simplicity. For very high-speed network links, it is important that queuing methodologies be computationally simple so that the switch or router does not become a bottleneck. One such methodology is the Deficit Round Robin (DRR) technique (M. Shreedhar and G. Varghese, Efficient Fair Queuing Using Deficit Round Robin, Washington University, St. Louis, Mo. (Oct. 16, 1995)). DRR was designed to ensure that each class of traffic being transmitted out of a particular network device output port receives a user-selectable percentage of the port's bandwidth.

Therefore, it would have been obvious to those having ordinary skill in the art at the time of the invention was made to implement a weighted deficit round robin algorithm in SRIRAM for fairness and implementation simplicity.

#### ***Allowable Subject Matter***

6. Claims 12-21 are allowed over prior art.
7. Claims 2-9 and 24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter: the prior art made of record does not teach a method and associated computer program product of transferring data packets from a plurality of groups for storing packets of data and a transmission channel having a total bandwidth, the method comprising: obtaining an indication of an amount of backlogged groups from among the plurality of groups;

allocating first portions of the total bandwidth of the channel to a plurality of backlogged groups according to weights associated with each backlogged group; and

allocating a second portion of the total bandwidth of the channel to be unused, the second portion being at least as large as an amount of the total bandwidth that exceeds a cumulative bandwidth of maximum bandwidths associated with the plurality of backlogged groups.

The prior art further fails to teach or fairly suggest in combination wherein the scheduler is configured to allocate channel bandwidth to a dummy group.

The prior art further fails to teach wherein the weighted deficit round robin algorithm includes a dummy for which the control means provides bandwidth to limit rates at which packets of data are transferred from the groups.

### **Conclusion**

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Aatresh (US 6,067,301) discloses a method and apparatus for forwarding packets contending queues of a multi-port switch to an output of a finite bandwidth

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involve first prioritizing the contending queues into different priorities that relate to priorities of the packets that are being forwarded in the network. Bandwidth of the output is then allocated among the prioritized contending queues and the bandwidth of the output consumed by the queued packet according to the allocated proportions.

Duffield et al (US 6,452,933 B1) discloses an apparatus for routing packets in a communication network comprises a plurality of per-connection queues, each queue established for receiving packets from a respective source and temporarily storing received packets before routing to a particular destination; a weighted fair-queuing scheduler for servicing packets from each of the plurality of per-connection queues at guaranteed pre-allocated rates

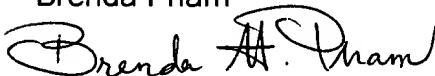
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brenda Pham whose telephone number is (571) 272-3135. The examiner can normally be reached on Monday-Friday from 9:00 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wellington Chin, can be reached on (571) 272-3134.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (571) 272-2600.

September 28, 2004

Brenda Pham

A handwritten signature in black ink that reads "Brenda A. Pham". The signature is written in a cursive style with a large, stylized "B" and "P".